

# Revision of the genera *Meteoria* and *Parasciadonus* (Bythitidae) with a new Atlantic, abyssal species of *Meteoria*

by

Jørgen G. NIELSEN (1)



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## Key words

Bythitidae  
*Meteoria*  
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New species  
Diagnosis

**Abstract.** – A revision is presented of the rare, abyssal-living former aphyonid now bythitid genera, *Meteoria* Nielsen, 1969 and *Parasciadonus* Nielsen, 1984. The type species of *Meteoria*, *M. erythrops* Nielsen, 1969 was based on a female and a juvenile specimen. Additionally, a ripe male of *M. erythrops* have been caught and furthermore two *Meteoria* specimens that vary so much from the type species that they are here described as a new species, *M. longidorsalis* n. sp. It differs from the type species *i.a.* by the short predorsal length, higher number of dorsal fin rays, smaller interorbital width and head profile. Furthermore, *Parasciadonus pauciradiatus* Nielsen, 1997 is reassigned to *Meteoria* leaving *Parasciadonus* with one species only, *P. brevibrachium* Nielsen, 1984. This makes it necessary to modify the generic diagnoses from Nielsen *et al.* (1999: 139).

**Résumé.** – Révision des genres *Meteoria* et *Parasciadonus* (Bythitidae) et description d'une nouvelle espèce de *Meteoria* abyssale de l'Atlantique.

Une révision des rares genres abyssaux, auparavant attribués aux Aphyonids et maintenant classés chez les Bythitids, que sont *Meteoria* Nielsen, 1969 et *Parasciadonus* Nielsen, 1984, est présentée. L'espèce type de *Meteoria*, *M. erythrops* Nielsen, 1969 se basait sur la description d'une femelle et d'un juvénile. Trois autres spécimens de *Meteoria* ont été collectés depuis. Ils comprennent un mâle mature de *M. erythrops* et deux autres spécimens, très sensiblement différents du spécimen type, qui sont ici considérés comme appartenant à une nouvelle espèce, *M. longidorsalis* n. sp. Celle-ci se distingue de l'espèce type par une longueur pré-dorsale réduite, un plus grand nombre de rayons à la nageoire dorsale, une distance inter-orbitaire plus faible et par le profil de sa tête. Par ailleurs, *Parasciadonus pauciradiatus* Nielsen, 1997 est réassigné au genre *Meteoria* et, en conséquence, *Parasciadonus* ne comprend plus qu'une espèce, *P. brevibrachium* Nielsen, 1984. Ces révisions nécessitent de modifier les diagnoses des genres proposées par Nielsen *et al.* (1999: 139).

According to a recent paper (Møller *et al.*, 2016), the family Aphyonidae is now considered a member of the family Bythitidae, which involves reassignment of the seven former aphyonid genera (Nielsen, 2015: tab. 1), now forming a monophyletic aphyonid clade within the Bythitidae.

Two of these genera, *Aphyonus* Günther, 1878 and *Barathronus* Goode & Bean, 1886 hold species that occur at depths well above 1000 m and are therefore occasionally caught. In contrast, the remaining five genera, *Meteoria* Nielsen, 1969, *Nybelinella* Nielsen, 1972, *Paraphyonus* Nielsen, 2015, *Parasciadonus* Nielsen, 1984 and *Sciadonus* Garman, 1899 are restricted to depths between 1075 and 5610 m and are consequently very rarely caught.

The present paper is a revision of the genera *Meteoria* and *Parasciadonus* based on reexamination of old material and three additional specimens. The description of the genus *Meteoria* was based on *M. erythrops* Nielsen, 1969 known from a ripe female and a juvenile specimen. Since then three additional specimens of *Meteoria* have been caught. One of these, a ripe male, belongs to *M. erythrops* (cf. Nielsen, 1972), but the other two specimens vary so much from *M. erythrops* that they are here described as a new species, *M. longidorsalis*. As the name indicates it differs *i.a.* by the

long dorsal fin-base. Furthermore, *Parasciadonus pauciradiatus* Nielsen, 1997 is here reassigned to *Meteoria* so that *Parasciadonus* now only holds the type species, *P. brevibrachium* Nielsen, 1984. Consequently, the generic diagnoses from Nielsen *et al.* (1999: 139) are modified as below.

## MATERIAL AND METHODS

The seven specimens examined were caught between the years 1948 and 1997 in bottom trawls working at depths of 3680–5320 m. Consequently, they are now rather bleached and due to the fragile skeleton, some of them are not in the best condition. Ichthyological terminology and counts follow Nielsen *et al.* (1999). Institutional abbreviations follow Fricke and Eschmeyer (2016). HT = holotype, PT = paratype, SL = standard length.

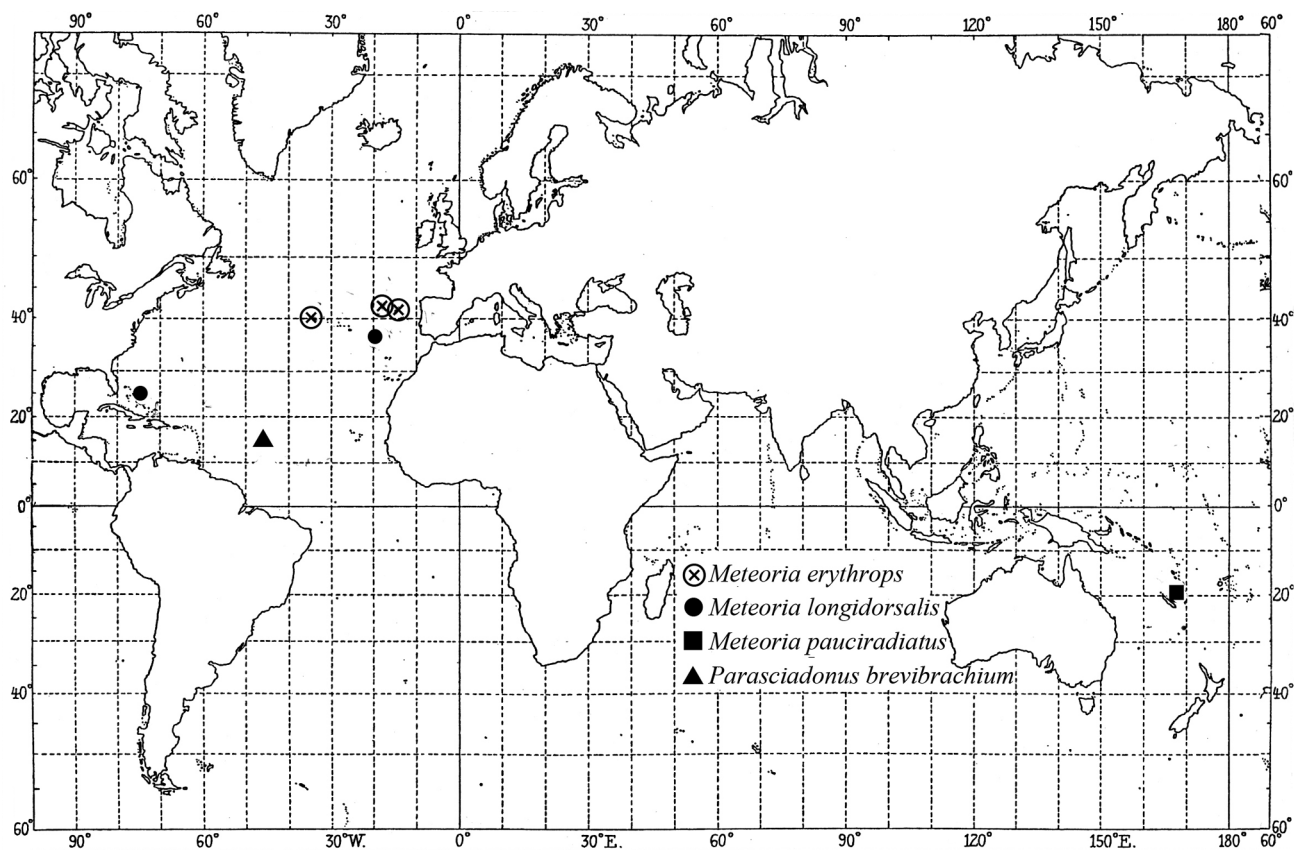
### *Meteoria* Nielsen, 1969

*Meteoria* Nielsen, 1969: 57, type species by monotypy *Meteoria erythrops* Nielsen, 1969.

(1) Zoological Museum, Natural History Museum of Denmark, Universitetsparken 15, 2100 Copenhagen Ø, Denmark.  
[jgnielsen@snm.ku.dk]

Table I. – Diagnostic characters of the genera in the aphyonid clade within the Bythitidae. \* Anterior gill arch with 0-11 rather short rakers, but they are 50-100% longer than the remaining 16-21 rakers.

|                      | Long gill rakers | Mouth hor./oblique | Pectoral peduncle | Lower jaw protruding | Pectoral rays | Caudal rays | Dorsal rays | Anal rays | Vertebrae | Pelvic rays |
|----------------------|------------------|--------------------|-------------------|----------------------|---------------|-------------|-------------|-----------|-----------|-------------|
| <i>Aphyonus</i>      | 3-4              | Horizontal         | Short             | No                   | 17-20         | 6-8         | 92-118      | 61-78     | 77-87     | 1           |
| <i>Barathronus</i>   | 23-35            | Oblique            | Short             | No                   | 21-26         | 9-11        | 62-85       | 46-71     | 70-89     | 1           |
| <i>Meteoria</i>      | 0                | Oblique            | Short             | No                   | 12-15         | 7-9         | 47-58       | 31-40     | 62-70     | 0           |
| <i>Nybelinella</i>   | 0-11*            | Oblique            | Short             | Yes                  | 22-27         | 8           | 70-92       | 45-57     | 72-79     | 1           |
| <i>Paraphyonus</i>   | 3-16             | Horizontal         | Short             | No                   | 12-17         | 7-8         | 59-81       | 47-58     | 62-71     | 1           |
| <i>Parasciadonus</i> | 0                | Horizontal         | Short             | Yes                  | 20            | 6-7         | 78          | 40-48     | 85        | 0           |
| <i>Sciadonus</i>     | 0                | Horizontal         | Long              | Yes                  | 9-16          | 7-8         | 68-107      | 40-59     | 68-88     | 0-1         |

Figure 1. – Records of species of *Meteoria* and *Parasciadonus*.

*Meteoria*: Cohen and Nielsen, 1978: 62; Nielsen *et al.*, 1999: 139; Nielsen, 2015: tab. 1.

### Diagnosis

The present generic diagnosis differs somewhat from that in Nielsen *et al.* (1999: 139) as the number of species has increased from one to three. Body slender, caudal part less than one third of standard length. Skin scaleless, loose and transparent. Eyes minute. Mouth opening oblique, lower jaw slightly protruding. Palatines edentate. Anterior gill arch with 0-10 minute rakers and few extremely small filaments.

Vertical fins joined. Rays in dorsal fin 47-58, in caudal fin 7-9, in anal fin 31-40, in pectoral fin 12-15 and in pelvic fin 0. Pectoral peduncle short, higher than long. Precaudal vertebrae 34-41 and total vertebrae 62-70. Skeleton poorly ossified. Vertebral centra in adults rectangular in lateral view. Genital hood developed in both sexes, claspers absent.

### Comparisons (see Tab. I)

Of the former aphyonid genera *Meteoria* seems most similar to *Parasciadonus* by sharing the following characters: anterior gill arch with very small rakers and filaments, pec-

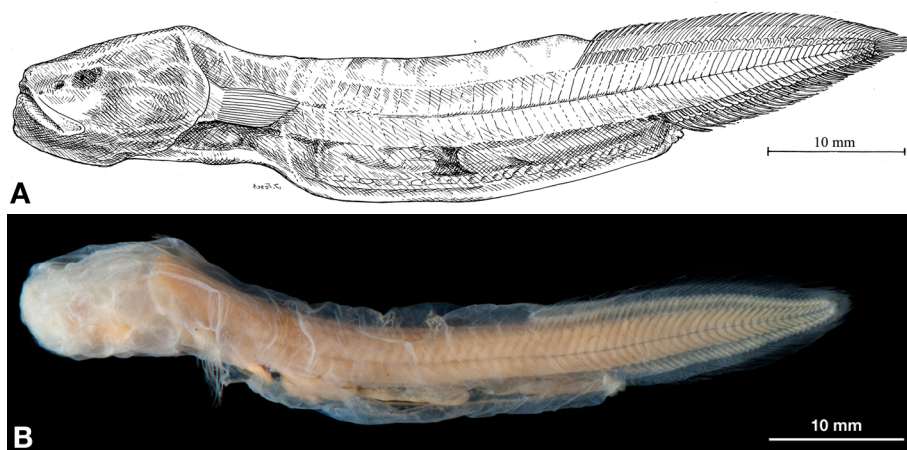


Figure 2. – *Meteoria erythroptera*, ZMH 25142, holotype, female, SL 63 mm. A: Drawing; B: Photo after 49 years of preservation.



Figure 3. – *Meteoria erythroptera*, ZMUC P77544, male, SL 70 mm, after 47 years of preservation.

toral peduncle short, pelvic fins and genital claspers absent. They differ by *Meteoria* having an oblique mouth cleft (vs horizontal mouth), lower jaw slightly or not protruding (vs lower jaw distinctly protruding), no skin flaps along lateral line (vs 12-19 small skin flaps along lateral line), dorsal fin rays 47-58 (vs 78), anal fin rays 31-40 (vs 40-48), pectoral fin rays 12-15 (vs 20).

### Species

The genus *Meteoria* holds three species known from six specimens five of which are caught in the warmer parts of the North Atlantic at 4540-5320 m depth and one off New Caledonia at 3680-3700 m (Fig. 1).

### Key to species of *Meteoria*

- 1a – Head profile convex; precaudal vertebrae 39-41; interorbital width 7.1-8.7% SL . . . . . *erythroptera*  
 1b – Head profile flat; precaudal vertebrae 34-37; interorbital width 4.9-6.1% SL . . . . . 2  
 2a – Dorsal fin rays 58; predorsal length 49.5-51% SL; origin of anal fin below dorsal fin ray 19-25 and below vertebra no. 40. . . . . *longidorsalis* n. sp.

- 2b – Dorsal fin ray 47; predorsal length 62% SL; origin of anal fin below dorsal fin ray 11 and below vertebra no. 33 . . . . . *pauciradiatus*

### *Meteoria erythroptera* Nielsen, 1969

(Tab. II, Figs 1-5)

*Meteoria erythroptera* Nielsen, 1969: 58 (type locality east of the Azores).

*Meteoria erythroptera*: Nielsen, 1972: 52; Cohen and Nielsen, 1978: 62; Krefft, 1978: 14; Nielsen *et al.*, 1999: 139.

Gen. et spec. indet.: Nybelin, 1957: 313.

### Material examined

*Holotype*. – ZMH 25142, SL 63 mm, female, east of Azores, 42°06.3'N, 14°42'W, R/V *Meteor*, cr. 3, st. 37, Agassiz trawl, 5320 m, 18-19 Mar. 1966.

*Non-types*. – NHMG Pi. 1746, SL 25 mm, juvenile, west of Azores, 40°32'N, 35°24'W, Swedish Deep-sea Exped., st. 387, bottom trawl, 4540-4600 m, 7 Sep. 1948; ZMUC P77544, SL 70 mm, male, off NE Spain, 42°54'N,

Table II. – Meristic and morphometric characters of the species of *Meteoria* and *Parasciadonus*. \* Remains indicate two lost rays; \*\* Number of vertebrae anterior to origin of anal fin.

|   | <i>Meteoria</i>  |                  |                |                      |                     |                      | <i>Parasciadonus</i> |
|---|------------------|------------------|----------------|----------------------|---------------------|----------------------|----------------------|
|   | <i>erythrops</i> |                  |                | <i>longidorsalis</i> |                     | <i>pauciradiatus</i> | <i>brevibrachium</i> |
|   | HT               | Non-type         | Non-type       | HT                   | PT                  | HT                   | HT                   |
|   | ZMH<br>25142     | NHMG Pi.<br>1746 | ZMUC<br>P77544 | USNM<br>222924       | BMNH<br>2015.5.27.1 | MNHN<br>1994-<br>767 | MNHN<br>1979-228     |
| Standard length in mm                   | 63               | 25               | 70             | 53                   | 75                  | 47                   | 72                   |
| Meristic characters                     |                  |                  |                |                      |                     |                      |                      |
| Dorsal fin rays                         | 50               | 48               | 50             | 58                   | 58                  | 47                   | 78                   |
| Caudal fin rays                         | 8                | 5+?*             | 8              | 9                    | 7                   | 8                    | 7                    |
| Anal fin rays                           | 34               | 34               | 40             | 39                   | 31                  | 40                   | 48                   |
| Pectoral fin rays                       | 14               | 13               | 15             | 15                   | 13                  | 12                   | 20                   |
| Pelvic fin rays                         | 0                | 0                | 0              | 0                    | 0                   | 0                    | 0                    |
| Long rakers on anterior gill arch       | 0                | 0                | 0              | 0                    | 0                   | 0                    | 0                    |
| Precaudal vertebrae                     | 41               | 39**             | 40             | 37                   | 37                  | 34                   | 50                   |
| Total vertebrae                         | 70               | 68               | 69             | 67                   | 65                  | 62                   | 85                   |
| Origin of dorsal fin above vertebra no. | 34               | 28               | 35             | 29                   | 23                  | 27                   | 52                   |
| Origin of anal fin below dorsal ray no. | 14               | 15               | 11             | 19                   | 25                  | 11                   | 33                   |
| Origin of anal fin below vertebra no.   | 41               | 39               | 42             | 40                   | 40                  | 33                   | 33                   |
| Morphometric characters in % of SL      |                  |                  |                |                      |                     |                      |                      |
| Head length                             | 20.0             | 22.0             | 19.0           | 18.0                 | 20.5                | 21.0                 | 16.5                 |
| Depth at anal fin origin                | 8.7              | 8.0              | 7.1            | 7.4                  | 7.7                 | 7.2                  | 7.0                  |
| Upper jaw length                        | 9.5              | 10.0             | 9.6            | 8.9                  | 10.0                | 9.1                  | 7.0                  |
| Snout                                   | 8.4              | 8.4              | 7.7            | 7.4                  | 9.2                 | 8.9                  | 5.3                  |
| Eye diameter                            | 0.5              | 1.0              | 0.4            | 0.6                  | 0.4                 | 0.4                  | 0.4                  |
| Interorbital width                      | 8.7              | 8.0              | 7.1            | 5.5                  | 6.1                 | 4.9                  | 4.9                  |
| Postorbital length                      | 12.5             | 12.5             | 12.0           | 10.0                 | 10.0                | 11.5                 | 8.9                  |
| Preanal length                          | 73.0             | 69.0             | 71.0           | 72.0                 | 71.0                | 69.0                 | 72.0                 |
| Predorsal length                        | 63.0             | 56.0             | 64.0           | 51.0                 | 49.5                | 62.0                 | 49.5                 |

13°25.1'W, R/V *Meteor*, st. 25/15, Agassiz trawl, haul 91, 5243 m, bottom temp. 2.6°C, 16-17 Sep. 1968.

### Diagnosis

*Meteoria erythrops* is long, compressed and rather slender with slightly protruding lower jaw and oblique mouth cleft. Head profile convex. Tiny, black eyes deep-set. A small area surrounding the eyes red-brown. Height of head and anterior body-depth equal. Head slightly broader than body. Palatines edentate. Dorsal fin origin well behind midpoint of fish. Dorsal fin rays 48-50. Predorsal length 56-64% SL.

### Description

The principal meristic and morphometric characters are shown in table II. Body rather elongate and compressed. Skin scaleless, transparent and very loose. Square head of same height as the body and only slightly broader. Mouth

opening oblique with slightly protruding lower jaw. Small, deep-set eyes situated above posterior end of lower jaw. No opercular spine. Dorsal fin origin well behind midpoint of fish (predorsal length 56-64% SL) and anal fin origin further back (preanal length 69-73% SL). Pectoral fin peduncle higher than or equal to length of peduncle. Anterior gill arch (Fig. 4) with 8-10 minute rakers in the outer row of the two larger specimens and 2-3 minute rakers in the small specimen (NHMG Pi. 1746), all placed on ceratobranchial. Gill filaments absent dorsally and poorly developed ventrally on the anterior arch while gill filaments on rakers 2-4 are fully developed. Pseudobranchial filaments not observed.

*Gonads.* – The 8 mm long ovaries of the holotype rather distended. Left ovary with about 450 eggs of which 98% are less than 0.25 mm in diameter (in average 0.1 mm) and the rest 0.35 mm in diameter. Histological examination of part of the ovary shows no fertilized eggs. Histological exami-



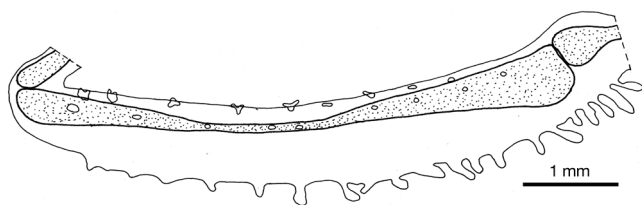


Figure 4. – *Meteoria erythropis*, ZMH 25142, holotype: anterior, right gill arch.

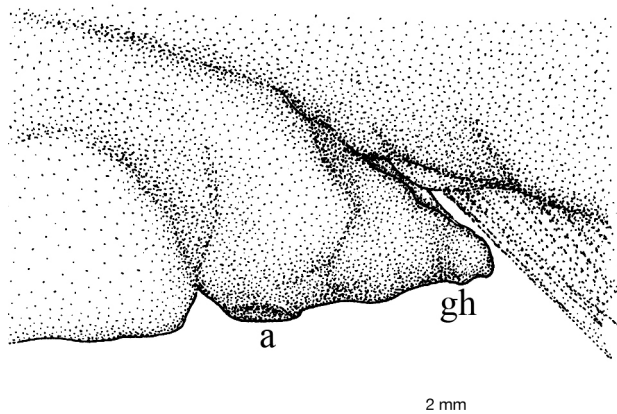


Figure 5. – *Meteoria erythropis*, ZMUC P77544, male, SL 70 mm. Intramittent organ: a, anus; gh, genital hood (Robert Nielsen illust.)

nation of part of the 15 mm long testes of ZMUC P77544 shows numerous spermatids, but no spermatozoa or spermatophores, which are generally found in adult males in the aphyonid clade. Intramittent organ (Fig. 5). Urogenital opening of the 70 mm long male (P77544) ventrally covered by a fleshy, genital hood covering a small penis-like papilla. Examination of the gonads shows unripe testes and it is known from other species in the aphyonid clade *e.g.* *Barathronus bicolor* Goode & Bean, 1886 that the penis is very short in unripe specimens (Nielsen, 1969: 42). Ripe female (ZMH 25142) with very small, genital hood. Claspers absent in both sexes.

**Axial skeleton.** – Number of precaudal vertebrae 40–41. Anterior neural spine equal in length to the following three spines and remaining neural spines all somewhat shorter. Parapophyses only developed on the last two precaudal vertebrae. Pleural and epipleural ribs absent. Vertebral centra rectangular in lateral view. Skeleton poorly ossified.

**Dentition.** – Anteriorly premaxillaries provided with 3–4 irregular tooth-rows near symphysis including a few double-sized, recurvated teeth. Number of tooth-rows decrease posteriorad to one row. Vomer with 14 pointed teeth in 1–2 rows placed on median half of bone. Dentaries with 2–3 uneven rows of recurvated, pointed teeth. Palatines edentate.

**Otolith.** – Dissolved. An old radiograph of ZMUC P 77544 (70 mm SL) shows sagittal otoliths about 0.5 mm in length.

**Coloration.** – The following colour observations were made six months after the capture of the holotype: skin transparent so the underlying tissues colour the specimen. A red brown area surrounding each of the black eyes. Peritoneum dorsally speckled with black pigment which also occurs at base of pectoral fin rays. The liver is brown.

#### Distribution (Fig. 1)

The three known specimens of *Meteoria erythropis* are all caught in non-closing bottom fishing gear (Agassiz and bottom trawls) in the northeastern Atlantic at depths of 4540–5320 meters.

#### Comparisons

*Meteoria erythropis* differs from the other two species of the genus, *M. longidorsalis* n. sp. and *M. pauciradiatus*, by the convex head profile (vs flat head profile), larger inter-orbital width (7.1–8.7 vs 4.9–6.1% SL) and more precaudal vertebrae (39–41 vs 34–37). It is difficult to decide to which of the two species *M. erythropis* is most similar because no male specimen of *M. pauciradiatus* is known.

#### *Meteoria longidorsalis* n. sp.

(Tab. II, Figs 1, 6)

#### Material examined

**Holotype.** – USNM 222924, SL 53 mm, male, Hatteras Abyssal Plain, 28°43.1'N, 75°49.7'W to 28°45.6'N, 75°52.5'W, R/V *Columbus Iselin*, cr. CI-1802, st. 04, 45' semi-balloon otter trawl, 5105 m, 12 Feb. 1978.

**Paratype.** – BMNH 2015.5.27.1, SL 75 mm, female, north of Madeira, 34°45.7'N, 18°30'W, R/V *Discovery*, st. 11134#1, 14' semi-balloon otter trawl, 4790–4880 m, 10 Jun. 1984.

#### Diagnosis

*Meteoria longidorsalis* n. sp. is long and slender with slightly protruding lower jaw and an oblique mouth cleft. Head broad and depressed. Palatines edentate and premaxillary, vomer and dentaries with a single row of small teeth. Eyes small and deep-set. Dorsal fin rays 58; dorsal fin origin at midpoint of fish; predorsal length 49.5–51% SL. Pectoral fin-peduncle short, higher than long. Pelvic fins absent. Anterior gill arch with hardly visible rakers and filaments.

#### Description

The principal meristic and morphometric characters are shown in table II. The description is based on the holotype; characters in which the paratype differs from the holotype are shown in brackets. Body elongate and compressed. Skin loose, scaleless and transparent. Head broad, depressed. Mouth opening oblique. Lower jaw slightly protruding. Eyes



Figure 6. – *Meteoria longidorsalis* n. sp. A: USNM 222924, holotype, male, SL 53 mm, after 37 years of preservation; B: BMNH 2015.5.27.1, paratype, female, SL 75 mm, photo after 31 years of preservation.

small, deep-set situated above posterior end of upper jaw. No opercular spine. Vertical fins joined. Dorsal fin origin at midpoint of fish and anal fin origin well behind midpoint of fish. Pectoral fin peduncle short, higher than long. Pelvic fins absent. Anterior gill arch without rakers (8-9 minute) and a few very small gill filaments ventrally on the arch, second arch with small rakers and filaments, third and fourth arches with small rakers and well developed filaments, fifth arch with a few small rakers. Pseudobranchial filaments not observed.

**Gonads.** – The long testes in holotype form 20% of SL. The much dilated ovaries of the paratype form 18% of SL and contain several large (0.7-0.9 mm in diameter) and many small (ca. 0.2 mm) eggs. Embryos were not observed.

**Intromittent organ.** – Both male and female specimen with a well-developed, fleshy genital hood; a pair of minute appendages at end of hood. Male with a short penis covered ventrally by the hood.

**Axial skeleton (from radiographs).** – Number of precaudal vertebrae 37. Anterior neural spine equal in length to the following spines. Parapophyses developed on precaudal vertebrae nos. 25-28 to no. 37. Pleural and epipleural ribs not developed. Vertebral centra rectangular in lateral view.

**Dentition.** – Premaxillaries, vomer and dentaries with a single row of very small, pointed teeth. Palatines edentate.

**Otolith.** – Dissolved. Old radiographs show sagittal otoliths about 0.5 mm in length.

**Coloration.** – Musculature brownish, light brown in paratype. Loose skin transparent. Small, deep-set eyes black.

### Distribution

*Meteoria longidorsalis* n. sp. is known from two specimens, one from east of Florida (5105 m depth) and one from north of Madeira (4790-4880 m depth) both caught in bottom trawls.

### Etymology

The specific name, *longidorsalis*, refers to the long dorsal fin base.

### Comparisons

*Meteoria longidorsalis* n. sp. differs from the other two species of the genus, *M. erythroptus* and *M. pauciradiatus*, by the higher number of dorsal fin rays (58 vs 47-50), position of the anterior anal fin ray in relation to the dorsal fin (below rays 19-25 vs 11-15) and predorsal length (49.5-51% SL vs 56-64% SL). *M. longidorsalis* n. sp. seems most similar to *M. pauciradiatus* with the flat head, the narrow interorbital width and rather few precaudal vertebrae.

### *Meteoria pauciradiatus* (Nielsen, 1997)

(Tab. II, Figs 1, 7)

*Parasciadenus pauciradiatus* Nielsen, 1997: 79 (type locality off New Caledonia).

*Parasciadenus pauciradiatus*: Nielsen *et al.*, 1999: 141.

### Material examined

**Holotype.** – MNHN 1994-767, SL 47 mm, female, off New Caledonia, 20°18.09'S, 167°17.7'E, BIOCAL, R/V *Jean Charcot*, st. DS 14, epibenthic dredge, 3680-3700 m, 13 Aug. 1985.

### Remarks

As a consequence of the description of *Meteoria longidorsalis* (presented above) it became evident that *Parasciadenus pauciradiatus* fits better into the genus *Meteoria* than into the genus *Parasciadenus*. This is clearly shown in table II especially by many meristic but also by morphometric characters.

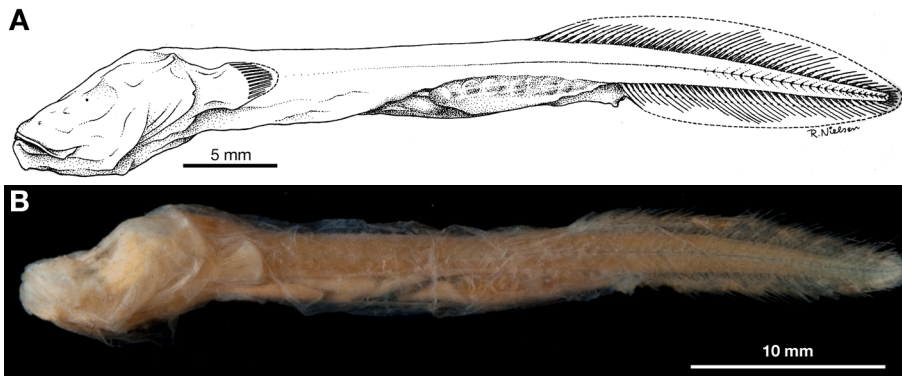


Figure 7. – *Meteoria pauciradiatus*, MNHN 1994-767, holotype, female, SL 47 mm. A: Drawing; B: Photo after 30 years of preservation.

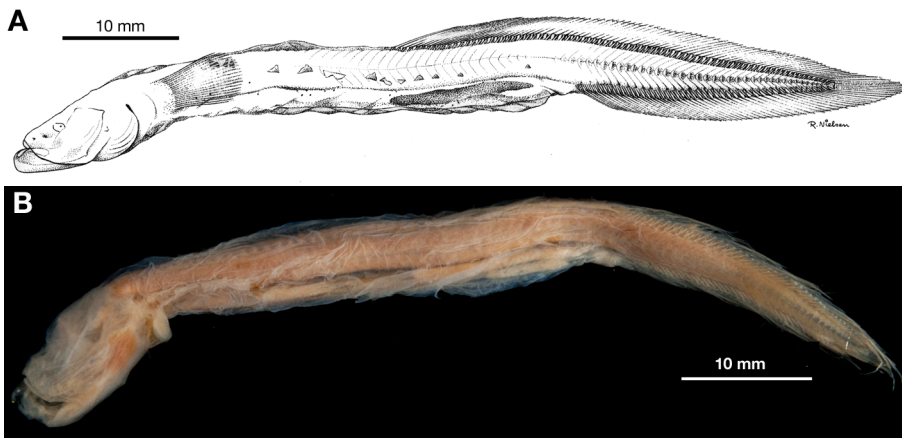


Figure 8. – *Parasciaddonus brevi-brachium*, MNNH 1979-228, holotype, female, SL 72 mm. A: Drawing; B: Photo after 38 years of preservation.

### Diagnosis

*Meteoria pauciradiatus* is long and slender with slightly protruding lower jaw and oblique mouth cleft. Head broad and depressed. Palatines edentate. Eyes small and deep-set. Dorsal fin rays 47; origin of dorsal fin well behind midpoint of fish; predorsal length 62% SL. Origin of anal fin below dorsal fin ray no. 11 and below vertebra no. 33. Pectoral peduncle short, higher than long. Pelvic fins absent. Anterior gill arch with minute rakers and filaments.

### Description

The principal meristic and morphometric characters are shown in table II. Body elongate and compressed. Skin loose, scaleless and transparent. Head broad and depressed. Mouth opening oblique. Lower jaw slightly protruding. Eyes small, deep-set and situated posterior to a line through end of upper jaw. Nostrils midway between eyes and upper lip. No opercular spine. Dorsal fin origin well behind midpoint of fish. Base of anal fin less than one third of SL. Anterior gill arch with ten minute rakers and a few, minute gill filaments, second arch with small rakers and filaments, third and fourth arches with small rakers and well developed filaments and fifth arch with a few small rakers. Pseudobranchial filaments not observed.

**Gonads.** – The 10 mm long ovaries (21% SL) extended with 20-25 fertilized eggs, 1-1.5 mm in diameter. Urogenital opening covered ventrally by a small genital hood.

**Axial skeleton (from radiographs).** – Number of precaudal vertebrae 34. Anterior neural spine equal in length to the following spines. Parapophyses developed only on the posterior three precaudal vertebrae. Ribs absent. Centrum of posterior precaudal vertebra twice as high as long.

**Dentition.** – Teeth very small. Premaxillaries and dentaries with 2-3 tooth rows anteriorly and one row posteriorly. Vomer with 10-12 teeth in one row. Palatines edentate.

**Otolith.** – Partly dissolved; less than 1 mm in length.

**Coloration.** – General colour yellowish without pigmentation, except for black eyes.

### Distribution

*Meteoria pauciradiatus* is known from one specimen caught off New Caledonia at 3680-3700 m in an epibenthic sledge.

### Comparisons

*Meteoria pauciradiatus* is most similar to *M. longidorsalis* (see above).

***Parasciadonus* Nielsen, 1984**

*Parasciadonus* Nielsen, 1984: 39, type species by monotypy *Parasciadonus brevibrachium* Nielsen, 1984.

*Parasciadonus*: Nielsen *et al.*, 1999: 141; Nielsen, 2015: tab. 1.

**Diagnosis**

The present diagnosis differs somewhat from that in Nielsen *et al.* (1999: 141) as the former *Parasciadonus pauciradiatus* is now reassigned to the genus *Meteoria*. Body slender, caudal part less than one third of standard length. Skin loose, scaleless and transparent. Small eyes deep-set. Mouth horizontal with lower jaw distinctly protruding. Minute skinflaps (12–19) along lateral line on each side of body. Palatines edentate. Anterior gill arch with 15 rakers developed as minute tubercles and a few minute filaments. Vertical fins joined. Rays in dorsal fin 78, in caudal fin 7, in anal fin 48, in pectoral fin 20 and in pelvic fin 0. Pectoral peduncle short, as high as long. Precaudal vertebrae 50 and total vertebrae 85, vertebral centra rectangular in lateral view. Urogenital opening covered ventrally by genital hood.

**Comparisons**

*Parasciadonus* is most similar to *Meteoria* (see above).

**Species**

After reassigning *Parasciadonus pauciradiatus* to the genus *Meteoria* only the type species remains in the genus.

***Parasciadonus brevibrachium* Nielsen, 1984**

(Tab. II, Figs 1, 8, 9)

*Parasciadonus brevibrachium* Nielsen, 1984: 40 (type locality Central Atlantic).

*Parasciadonus brevibrachium*: Nielsen *et al.*, 1999: 141.

**Material examined**

*Holotype*. – MNHN 1979-228, SL 72 mm, female, Central Atlantic, 10°59'N, 45°15'W, Biovema, st. A (CP 02), bottom trawl, 5073 m, 14 Nov. 1977.

**Diagnosis**

As of genus.

**Description**

The principal meristic and morphometric characters are shown in table II. Body elongate and compressed. Skin loose, scaleless and transparent. Minute skinflaps (12–19) along lateral line on both sides of body. Head about double as wide as body with a flat profile. Mouth opening horizontal. Lower jaw distinctly protruding. Small eyes deep-set,

placed well behind posterior end of upper jaw. Nostrils midway between upper lip and eyes. No opercular spine. Dorsal fin origin at midpoint and anal fin origin well behind midpoint of fish. Pectoral peduncle short, as high as long. Pelvic fins absent. Figure 9 shows the presence of 15 minute rakers on the anterior gill arch and a few poorly developed gill filaments; both rakers and filaments more developed on 2<sup>nd</sup>–4<sup>th</sup> gill arches. Pseudobranchial filaments not observed.

*Gonads*. – A histological examination of part of the 12 mm long ovaries (16.5% SL) shows many eggs of different sizes (up to 0.5 mm). No embryos, but numerous spermatozoa observed in the ovarian tissue. A distinct genital hood. Claspers not developed.

*Axial skeleton (from radiographs)*. – Number of precaudal vertebrae 50. Anterior neural spine equal in length to the following spines. Ribs and parapophyses absent. Centrum of posterior precaudal vertebra twice as high as long.

*Dentition*. – Anterior half of dentaries with 2–3 irregular rows of small, sharp, retrorse teeth near symphysis with longest teeth in inner row and further back teeth in a single row; posterior half of dentaries edentate. Similar dentition on premaxillaries. Palatines edentate. Vomer with a few very small, blunt teeth.

*Otolith*. – Now dissolved, but old radiographs show that the sagittal otoliths were about 1 mm in length.

*Coloration*. – General colour yellowish. Scattered, black pigment on peritoneum and in dorsal midline. Eyes black.

**Distribution**

*Parasciadonus brevibrachium* is known from one specimen caught in the Central Atlantic in a bottom trawl at a depth of 5073 m.

**Remarks**

The fact that the four species treated in this paper are known from seven specimens only, shows how rarely they are caught, but it is difficult to judge how rare the species actually are considering how few abyssal trawl hauls that have been undertaken. In the last decades the number of hauls has decreased even further while the number of photos from abyssal depths has increased considerably. Unfortunately, quite often a specific identification of the speci-

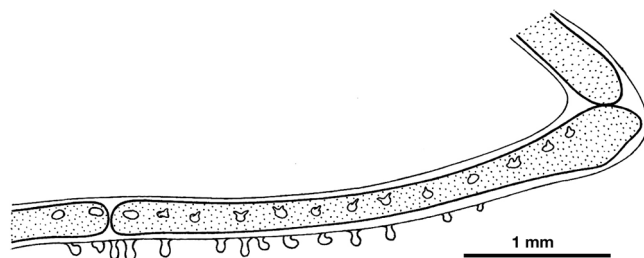


Figure 9. – *Parasciadonus brevibrachium*, MNNH 1979-228, holotype: anterior, left gill arch.



mens shown on the photos is not possible. More sampling is required in the deep sea!

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## Correction

Nielsen (2015) described a new genus, *Paraphyonus*, with two new species, *iselini* and *merretti*. The latter species was named after Dr. Nigel R. Merrett, England. In the submitted manuscript the species was named *nigeli*, but one of the reviewers strongly recommended *merretti*. Consequently, I changed the name but unfortunately overlooked the use of *nigeli* in two cases: p. 329 (Key to species) and p. 338 (Table 4).